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REMARKS

The issues currently in the application are as follows:

- Claims 1-5, 7-9, 18-19, 29, and 31 were rejected under 35 U.S.C. § 103(a) in view of USPN 5541622 (Engle) and USPN 6441753 (Montgomery);
- Claims 6, 10-17, 20-23, 27, 30, and 36 were rejected under 35 U.S.C. § 103(a) in view of USPN 5541622 (Engle), USPN 6441753 (Montgomery), and USPN 6377685 (Krishnan); and
- Claims 24-26, 28, and 32-35 were objected to as being dependent upon a rejected base claim.

Applicant traverses all the outstanding objections and rejections and requests reconsideration and withdrawal thereof in light of the remarks contained herein.

35 U.S.C. § 103(a) – Engle and Montgomery

Claims 1-5, 7-9, 18-19, 29, and 31 were rejected under 35 U.S.C. § 103(a) as being anticipated (sic) by U.S. Patent No. 5,541,622 (Engle) in view of U.S. Patent No. 6,441,753 (Montgomery). Engle proposes a joystick with an integrated switch and force-sensitive resistor elements. The integrated switch (tip switch) of Engle relieves the user from having to explicitly actuate a separate switch to enable pointing. Moreover, the tip switch is small and has little or no travel, so a user may not even be aware of its presence. See Engle column 4 lines 11-23. Engle provides four embodiments for an integrated switch that would not be readily noticeable by a user of the joystick. One embodiment of Engle has a rubber dome 166 as part of the integrated switching mechanism, which enables the user to close the switch using a small force and without necessarily being aware of the switch. See Engle column 7 lines 28-43. Another embodiment of Engle shows a capacitive sensor as a switch in FIG. 2. The capacitive sensor has a rubber cap 194 and electrode 196 and requires no applied force or travel of the cap 194. See Engle column 8 lines 17-46. A third

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embodiment of Engle uses a resistive sensor with a central electrode 218 separated from an outer electrode 214 by an insulating gap 216 as shown in FIG. 3A and 3B and described in column 9 lines 1-23 as requiring no movement to close the switch. A fourth embodiment of Engle uses a rubber air-gap switch 228, 226, 230 shown in FIG. 4 and described in column 9 lines 23-50 that also allows the switch to close without the user being aware of it.

Montgomery shows a multi-function key assembly in FIG. 2 having a popple dome array 26 (also shown in FIG. 12) and central and peripheral plungers 72 and 54-68.

Replacing the integrated switch of Engle with the plungers 72, 54-68 and popple dome array 26 goes against the teachings of Engle, which desire an unobtrusive, integrated switch that would not be readily noticeable by a user of the Engle joystick. Thus, it would not be obvious to one of ordinary skill in the art to combine Engle and Montgomery.

Claim 1 recites that the switch includes a popple dome. As described in paragraph [0022] of the originally-filed specification, a popple dome helps protect against inadvertent key presses and also provides tactile feedback when a key press has activated the central switch. As paragraph [0025] of the originally-filed specification describes, tactile feedback to the user is promoted. This is opposite to Engle's joystick where tactile feedback to the user is inhibited. See also paragraphs [0030] and [0042] of the originally-filed specification, which describe popple domes with large dome travel distances during actuation.

Because Engle does not show or suggest a popple dome, and in fact teaches away from the use of a popple dome, Montgomery cannot be combined with Engle, and claim 1 as previously presented is not unpatentable in view of Engle and Montgomery. Claims 2-5 and 7-9 depend directly or indirectly upon independent claim 1 and, therefore, are also not unpatentable in view of Engle and Montgomery.

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Specifically regarding claims 4-5, Engle does not propose primary and secondary functions. The Examiner interprets Engle's joystick, which allows control of a cursor in at least two different directions, as providing more than one function. This is not in accordance with the understanding of one of ordinary skill in the art. Engle provides only a single function, which is directional control, using a single switch. No matter how many directions the Engle joystick can control and at what cursor speeds, it is still a single function. According to Engle, moving to the right is not a separate function from moving to the left, moving up is not a separate function from moving to the right, and moving fast is not a separate function from moving slow. Note that different joysticks may implement moving to the right as a separate function from moving to the left (or moving up as a separate function from moving to the right), but Engle's joystick is not such a multi-function joystick.

Additionally with respect to claim 4, Applicant does not understand how the Examiner can assert that Montgomery discloses a first, second, and third force value that correspond to key regions, wherein the force is compared in order to prevent accident depression of a key region. Column 6 lines 15-27 of Montgomery simply state that the central dome switch requires a higher force to be depressed than the perimeter popple domes. A difference in required force for two different types of dome switches is not the same as a comparison of force values.

Engle is pre-loaded with a small initial force so that the force-sensitive resistor elements operate in a more predictable (e.g., linear) region of operation. See Engle column 6 line 15 to column 7 line 2. Engle does not compare an applied force to a pre-load force; any applied force in Engle is in addition to the pre-load force. This is clear from column 6 lines 3-14, which specify that the pre-load spring 181 is partially compressed during manufacture. The Examiner is invited to point out where Engle stores a threshold value and compares it to multiple force values, because Applicant cannot find such a threshold value in Engle. Thus, Engle does not anticipate comparing force values to a stored threshold value as recited in claims 4-5.

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Claims 18-19 depend directly from claim 11, which has not been rejected in view of Engle and Montgomery. Thus, claims 18-19 are not unpatentable in view of Engle and Montgomery.

Claim 29 was previously amended to recite a switch having a popple dome. As stated before with respect to claim 1, Engle teaches away from including a popple dome in its joystick with integrated switch and thus the Examiner cannot combine the popple dome of Montgomery with Engle. Thus, previously presented claim 29 is not unpatentable in view of Engle and Montgomery.

Claim 31 was previously amended to recite a switch having a popple dome. As stated before with respect to claim 1, Engle teaches away from including a popple dome in its joystick with integrated switch and thus the Examiner cannot combine the popple dome of Montgomery with Engle. Thus, previously presented claim 31 is also not unpatentable in view of Engle and Montgomery.

Reconsideration and withdrawal of the rejection of claims 1-5, 7-9, 18-19, 29, and 31 under 35 U.S.C. § 103(a) as being unpatentable in view of Engle and Montgomery is respectfully requested.

35 U.S.C. § 103(a) – Engle, Montgomery, and Krishnan

Claims 6, 10-17, 20-23, 27, 30, and 36 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,541,622 (Engle) in view of U.S. Patent No. 6,441,753 (Montgomery) and U.S. Patent No. 6,377,685 (Krishnan). To summarize the cited references: Engle's device is a force-sensing directional joystick among many single-function keys; Montgomery's device is a multi-function key with popple domes; and Krishnan is a cluster key with popple domes. None of the teachings in these references can be combined to result in the claimed multi-functional force-sensing key without using impermissible hindsight. It would not be obvious to combine the joystick of Engle into a particular cluster key of Krishnan. Engle shows a joystick as part of a keyboard, but Engle's joystick does not replace any key(s) of a

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conventional keyboard. Thus, a combination of Engle and Krishnan would result in a Krishnan keyboard with an added joystick rather than Krishnan cluster keys having the construction of Engle's joystick as the Examiner has reconstructed in hindsight.

Claims 6 and 10 depend indirectly upon claim 1, which is not obvious in view of Engle, Montgomery, and Krishnan for the reasons stated above. Thus, claim 6 is not unpatentable in view of Engle and Krishnan. Additionally, claim 6 depends from claims 1 and 5, which are not shown or suggested by Engle, Montgomery, or Krishnan. Claim 10 depends from claims 1 and 7, which are not shown or suggested by any reasonable combination of Engle, Montgomery, or Krishnan.

Regarding claim 11, the Examiner interprets a first central switch as the Engle joystick 272 with an integrated switching mechanism and a second central switch as the Engle switch 244 under a keycap 242 for a computer keyboard, all shown in FIG. 5 of Engle. Note that with the Examiner's interpretation, Engle fails to show or suggest "a second actuator for the second central switch, the second actuator having a first side adapted for receiving an externally applied force, and a plurality of contact surfaces on a second side, the plurality of contact surfaces on the second side corresponding to the second central switch and one or more associated satellite force sensing pads, wherein the second actuator has multiple actuations, each actuation being distinguishable by an evaluation of the forces sensed by the one or more associated satellite force sensing pads" are recited in claim 11.

Claims 12-17, 20-23, and 27 depend directly or indirectly upon claim 11, which is also not unpatentable in view of Engle, Montgomery, and Krishnan. Claim 13 recites that at least one of the one or more satellite force sensing pads is associated with more than one of the first central switch and the second central switch, which is not shown by the cited references. Having the switch of Engle centered below the shaft of the joystick merely means that a satellite force sensing pad is associated with the first central switch; it does not mean that a satellite force sensing pad is associated with more than one central switch. Claims 14-15 recites different character inputs,

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which are not shown or suggested by any reasonable combination of Engle, Montgomery, or Krishnan. The Examiner inappropriately discards the teachings of Engle, which show separate keys for character entry, in order to create a joystick for selecting different characters. Claims 21-23 recite comparing forces sensed to a stored threshold value, which is not shown or suggested in Engle, Montgomery, or Krishnan. Like Montgomery, Krishnan merely senses a depressed condition and does not compare forces. None of Engle, Montgomery, or Krishnan stores a threshold value. The process of being activated during a logic high "1" state as mentioned in Krishnan and implied in Montgomery is not storage of a value and comparing the received input to the value. As electrical engineers are aware, a certain input voltage will cause an electrical reaction without any comparison step.

Although claims 25-26 were initially listed in numbered paragraph 2 on page 8 of the Office Action as being rejected, the Examiner has not provided any reasons for rejecting claims 25-26 and explicitly indicates in numbered paragraph 4 on page 16 of the Office Action that claims 25-26 were be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Thus Applicant presumes the inclusion of claims 25-26 in numbered paragraph 2 on page 8 was a typographical error.

Regarding claim 27, Krishnan does not disclose a secondary key press based upon the greatest force detected on a region of the key cluster. Instead, Krishnan eliminates the pressing of multiple secondary keys 104 (or a primary key 101 and one or more secondary keys 104) using the mechanical arrangement shown in FIGs. 4-5 or by producing an error signal to the user when multiple keys in a single cluster key are depressed. See Krishnan column 15 lines 9-29. Thus, Krishnan teaches a mechanical arrangement rather than a comparison algorithm to detect a secondary key press. It would not be obvious to go against the teachings of both Engle and Krishnan to result in claim 27. The Examiner has improperly used hindsight reconstruction to reject claim 27.

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Claim 30 depends from independent claim 29, which is not obvious in view of Engle and Krishnan for the reasons stated above. Thus, claim 30 is also not obvious in view of Engle and Krishnan.

Claim 36 is not obvious in view of Engle and Krishnan for the reasons stated above.

Reconsideration and withdrawal of the rejection of claims 6, 10, 14-17, 20-23, 27, 30, and 36 under 35 U.S.C. § 103(a) as being obvious in view of Engle and Krishnan is respectfully requested.

Allowable Subject Matter

Applicant acknowledges that the Examiner has indicated that claims 24-26, 28, and 32-35 would be allowable if rewritten in independent form including all of the limitations of the base claims and any intervening claims.

SUMMARY

The application is in condition for allowance and a favorable response at an early date is earnestly solicited. Should the Examiner have any questions, comments, or suggestions, the Examiner is invited to contact Applicant's representative at the telephone number indicated below.

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Please charge any fees associated herewith, including extension of time fees, to
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Respectfully submitted,

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